REMARKS

Applicants appreciate the thoroughness with which the Examiner has examined the above-identified application. Reconsideration is requested in view of the amendments above and the remarks below.

Applicants appreciate the Examiner's entering of the affidavit filed on October 31, 2005 under 37 C.F.R. § 1.131 that was deemed sufficient to overcome the reference of Edelstein, et al.

Rejection under 35 U.S.C. § 102

Claims 1-30 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Aoude, et al. (U.S. Patent No. 5,337,475, hereinafter "Aoude"). Applicant respectfully traverses this rejection.

Aoude teaches an improved via-filling composition for producing conductive vias in ceramic substrates having circuitry. The composition is a mixture of ceramic spheres and conductive metal particles. The via-filling compositions comprise pastes containing a mixture of: (a) ceramic and/or glass spheres of substantially uniform diameter between about 0.5 and 6 microns; (b) conductive metal particles or spheres having a maximum dimension or diameter between about one-third and one-quarter of the diameter of the ceramic and/or glass spheres; and (c) a binder vehicle. Aoude, col. 4, ll.3-20.

The Aoude invention also includes a small amount of sol-gel colloid material, such as the aluminum compound Al_2O_3 to preserve the metal phase connectedness during sintering. Aoude, col. 4, ll.29-37.

Importantly, the Aoude art represents a glass ceramic co-fired application for composite vias. As such, green sheets are used as well as full paste compositions containing binders. As discussed in the instant specification, the present invention is patentably distinct over Aoude for a number of reasons. In the present invention, co-firing the substrate is not performed since the vias being filled are in dense silicon. Specification, ¶¶ 11 and 24. The same is not true of the Aoude design.

> *[I]t is critical that the present composition via paste compositions co-sinter with the host body during firing thereof*, and that the Cu conductor phase not melt. Such co-sintering or densification by tile simultaneous coalescence of the glass-ceramic particles of the via composition and of the dielectric layers of the host body eliminates the formation of pores and cracks at the via hole interface … .

Aoude, col. 4, l.67 – col. 5, l.6 (emphasis added).

Moreover, the present invention does not require sintering to a fully dense structure. Firing the present invention to full density is detrimental since it ultimately results in a large void formation due to the volumetric shrinkage that occurs during densification of the glass phase in the via. "[T]he system is designed to allow the copper particles to achieve full density *prior to the densification of the glass* (dielectric) material." Specification, ¶ 25 (emphasis added).

Last, the present invention discloses a paste free of binders to alleviate the problem of binder burnout. Specification, ¶ 11. "The suspensions may be fired in neutral or reducing environments due, in part, to the absence of organic binders." Specification, ¶ 11. In contrast, Aoude specifically requires a binder vehicle.

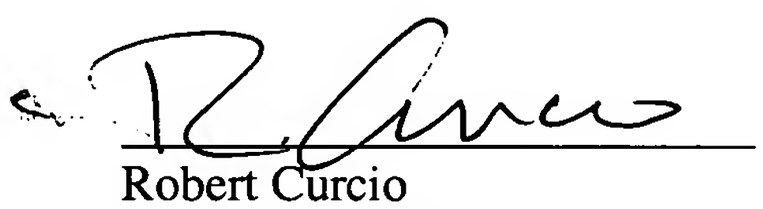
> The via-fill compositions are present in a flowable liquid paste containing a binder material, preferably a resinous binder material which is similar to the resinous binder material of the dielectric layer composition so as to burn off therewith during the firing of the multilayer substrate or body.

Aoude, col. 4, ll.14-20.

Applicants have amended claims 1, 18, 20 and 21, and have combined the limitations of claim 19 into claim 18, to reflect the distinctions described above.

It is respectfully submitted that the application has now been brought into a condition where allowance of the entire case is proper. Reconsideration and issuance of a notice of allowance are respectfully solicited.

Respectfully submitted,



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